

9. Mayers MM, Kaufman DM, Miller MH: Recent cases of intracranial tuberculomas. *Neurology (Minneapolis)* 1978; 28:256-260
10. Borne G: Trigeminal neuralgia as the presenting symptom of a tuberculoma of the cerebellopontine angle—Case report. *J Neurosurg* 1968; 28:480-482
11. Boghen D, Filiatrault R, Descarries L: Myokymia and facial contracture in brain stem tuberculoma—A clinicopathologic report. *Neurology (Minneapolis)* 1977; 27:270-272
12. Haskett JR Jr, Branch CE Jr, Buscemi JH: Brainstem tuberculoma: Value of sequential computed tomography. *Ann Neurol* 1979; 6:275-276
13. Diaz-Calderon E, Gimeno-Alava A, Diaz A, et al: Tuberculoma of the pons (Letter). *J Neurol Neurosurg Psychiatry* 1981; 44:266
14. Mahanta A, Kalra L, Maheshwari MC, et al: Brain-stem tuberculoma: An unusual presentation. *J Neurol* 1982; 227:249-253
15. Price HI, Danziger A: A computed tomography in cranial tuberculosis. *AJR* 1978; 130:769-771
16. Peatfield RC, Shawdon HH: Five cases of intracranial tuberculoma followed by serial computerized tomography. *J Neurol Neurosurg Psychiatry* 1979; 42:373-379
17. Welchman JM: Computerized tomography of intracranial tuberculomata. *Clin Radiol* 1979; 30:567-573
18. Bhargava S, Tandon PN: Intracranial tuberculomas: A CT study. *Br J Radiol* 1980; 53:935-945

## Pasteurella multocida Urinary Tract Infection

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*PASTEURELLA MULTOCIDA* is a small, gram-negative bacillus most commonly recognized as a cause of soft tissue infection in animal bites and scratches.<sup>1</sup> *P multocida* urinary tract infections are rare and all reported cases have occurred in debilitated patients.<sup>2</sup> To our knowledge, this is the first reported case of *P multocida* causing a symptomatic urinary tract infection in an otherwise healthy woman.

### Report of a Case

The patient, a 31-year-old woman, was admitted for fever, flank pain and bacteriuria. Except for a 20-pack-year smoking history, she was in good health. Ten years earlier she presumably had a left pyelonephritis.

Three weeks before admission right flank pain developed without dysuria, hematuria or other urologic symptoms. She had no history of recurrent cystitis. The findings of a recent pelvic examination were reportedly within normal limits. She owned a dog that frequently slept in her bed and the dog occasionally drank water from the commode. The patient had no occupational exposure to animals.

At that time her temperature was 38.5°C (101°F). On physical examination there was right costovertebral angle tenderness. A urinalysis showed four to six erythrocytes per high-power field (HPF), four to seven leukocytes per HPF, occasional bacteria and a positive leukocyte esterase test. A complete blood count showed 12,200 leukocytes per  $\mu$ l (67% segmented neutrophils, 12% bands, 13% lymphocytes and 8% monocytes). The patient took trimethoprim-sulfamethoxazole for one day before seeking treatment; a urine culture was not done. She was then treated for two weeks with oral administration of ampicillin, 500 mg four times a day.

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One week before admission, recurrent flank pain, fevers and chills developed. She continued to say she did not have lower urinary tract symptoms. She became febrile to 38.5°C, had rigors and was admitted to hospital.

On physical examination there was pronounced right costovertebral angle tenderness. Pelvic examination findings were not reported. Levels of serum electrolytes, urea nitrogen, creatinine and hemoglobin were normal. A leukocyte count was 12,000 per  $\mu$ l (69% segmented neutrophils, 13% band, 8% lymphocytes and 10% monocytes). A urinalysis showed a specific gravity of 1.020, pH 5.5, trace-positive leukocyte esterase, negative for nitrite, a moderate amount of blood, 6 to 12 erythrocytes per HPF, 20 leukocytes per HPF and a moderate amount of bacteria.

A regimen of amikacin, 500 mg given intravenously every 12 hours, and cephalothin, 1 gram given parenterally every 6 hours, was begun. Culture of urine specimens grew *Pasteurella multocida*, more than 100,000 organisms per ml; blood cultures were not done. This small gram-negative rod did not grow on MacConkey agar but on blood agar produced small, nonhemolytic, translucent colonies with a characteristic musty odor. The organism was indole-positive, and was differentiated and identified by the API 20E system. The organism was sensitive to ampicillin, cephalothin, gentamicin, tetracycline, trimethoprim-sulfamethoxazole, nitrofurantoin and nalidixic acid. After 24 hours of parenteral therapy, treatment was changed to cephadrine, 500 mg given orally every six hours, for a total of two weeks. Urine cultures were sterile 48 hours after admission and her symptoms resolved.

A renal ultrasonogram showed normal kidneys with no hydronephrosis or hydroureter. On excretory urography there was focal cortical loss of the left kidney (overall size 12.5 cm), consistent with old pyelonephritis. The right kidney was enlarged and ptotic (14 cm), suggesting acute pyelonephritis. The study findings were otherwise unremarkable. A cystogram showed a large-capacity (450 ml) bladder without vesicoureteral reflux.

The patient became afebrile and was discharged on oral cephalosporin therapy. Follow-up cultures ten days after completion of therapy were negative, and the patient remained free of symptoms four weeks after discharge.

### Comment

*Pasteurella multocida* commonly causes disease in animals. It can be isolated from the upper airways of as many as 54% of dogs and as many as 70% of cats.<sup>2-4</sup> Infections in humans are usually related to animal bites and scratches and remain localized, but a variety of complications including septicemia and distant infectious foci have been reported.<sup>1,5,6</sup> Unusual human infections described with this organism include pneumonia, meningitis, brain abscess, epiglottitis, peritonitis, liver abscess, appendiceal abscess, puerperal sepsis, septic arthritis, osteomyelitis and bacteremia.<sup>7,8</sup>

Infections by *P multocida* of the urinary tract are rare, occurring in chronically ill patients. Hubbert and Rosen described a total of 253 cases of *Pasteurella* infections unrelated to animal bites; in only 5 of these cases was the organism identified in a urine specimen.<sup>9</sup> Komorowski and Farmer reported two cases of urinary infection due to *P multocida*.<sup>10</sup> A 15-year-old boy in chronic renal failure with an ileal loop<sup>11</sup> and a 26-year-old woman with cervical carcinoma complicated by vesicoureteral reflux and renal failure<sup>2</sup> have been reported to have *P multocida* urinary tract infections.

The reason infection with this unusual organism developed in our patient is not clear. Decreased host defenses and major structural abnormalities characterize all previous cases but were not present in our patient. Results of her radiographic and ultrasonographic studies suggested previous pyelonephritis, so we cannot say her urinary tract was unequivocally normal. But it lacked major structural abnormalities, such as vesicoureteral reflux, that would predispose to infection. We have no reason to suspect a primary bacteremia with secondary seeding of the kidney.

The source of the organism is also of interest. *P. multocida* organisms have been identified in the upper respiratory tract of healthy persons and patients in hospital.<sup>10,12</sup> Most patients with *Pasteurella* urinary tract infection have been in proximity to dogs or cats and some investigators speculate contact with these animals as a source.<sup>3,11</sup> The female genitalia may serve as a focus of infection—vaginitis, cervicitis and Bartholin's gland abscess have been reported.<sup>2,3,5</sup> There are no data on the role of intentional or accidental direct contact with oral secretions of animals. While there are a few reports of medical consequences of bestiality,<sup>13,14</sup> we could find no literature relating this unusual practice to urinary tract infections. Bestiality was not suspected in this case. Direct contact with oral secretions may not be necessary to cause infection, as the organism can be dormant for long periods.<sup>2</sup> Our patient's dog frequented both her bedroom and her bathroom. The dog's oral cavity was culture-positive for a heavy growth of *P. multocida*, and it may have been the source of the infection.

Treatment is uncomplicated in most cases. A characteristic of *P. multocida* is its sensitivity to penicillin.<sup>10</sup> Reported cases have responded to penicillin,<sup>10</sup> gentamicin<sup>11</sup> and trimethoprim-sulfamethoxazole therapy.<sup>2</sup> Why our patient's symptoms recurred after a two-week course of ampicillin is not known, but it may reflect a failure of nonparenteral antimicrobial therapy in upper urinary tract infections or patient noncompliance. Moreover, the role of individual antibiotics in this case is obscured by the patient's receiving multiple antibiotics. Her rapid defervescence after parenteral therapy and her uneventful recovery suggest that treatment of *P. multocida* urinary tract infections should be straightforward.

#### REFERENCES

1. Frances DP, Holmes MA, Branden G: *Pasteurella multocida* infections after domestic animal bites and scratches. JAMA 1975; 233:42-45
2. Warren JS, Smith JW: *Pasteurella multocida* urinary tract infection. Arch Pathol Lab Med 1984; 108:401-402
3. Dixon JMS, Keresteci AG: Renal infection with *Pasteurella multocida*. Can Med Assoc J 1967; 97:28-29
4. Owen CR, Baker ED, Bell JF: *Pasteurella multocida* in animals' mouths. Rocky Mt Med J 1968; 65:45-46
5. Hubbert WT, Rosen MN: I. *Pasteurella multocida* infection due to animal bite. Am J Public Health 1970; 60:1103-1108
6. Furie RA, Cohen RP, Hartman BJ, et al: *Pasteurella multocida* infection: Report in urban setting and review of spectrum of human disease. NY State J Med 1980; 80:1597-1602
7. Beyt BE Jr, Sondag J, Roosevelt TS, et al: Human pulmonary pasteurellosis. JAMA 1979; 242:1647-1648
8. Johnson RH, Rumans LW: Unusual infections caused by *Pasteurella multocida*. JAMA 1977; 237:146-147
9. Hubbert WT, Rosen MN: II. *Pasteurella multocida* infection in man unrelated to animal bite. Am J Public Health 1970; 60:1109-1117
10. Komorowski RA, Farmer SG: *Pasteurella* urinary tract infections. J Urol 1974; 111:817-818
11. Baliah T, Netter E: *Pasteurella multocida* infection of urinary tract in patient with ileal loop. Urology 1977; 9:294-295
12. Itoh M, Tierno PM, Milstoc M, et al: A unique outbreak of *Pasteurella multocida* in a chronic disease hospital. Am J Public Health 1980; 70:1170-1173
13. Chee KT: A case of bestiality. Singapore Med J 1974; 15:287-288
14. Tournier C, Croguennec B, Pillegand B, et al: Rectal ulcers caused by animal sodomy (Letter). Nouv Presse Med 1981; 10:1152

## Disseminated Actinomycosis

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ACTINOMYCES ISRAELII, a normal constituent of oral flora, is an opportunistic organism requiring interruption of the mucosal barrier to be pathogenic.<sup>1</sup> Most commonly, actinomycetic organisms burrow without regard for facial tissue planes, resulting in draining sinuses and masses of abundant granulation surrounded by dense fibrous tissue. The following is a report of a case of disseminated actinomycosis presenting with nonspecific constitutional symptoms and radiographic findings. This case shows the indolent nature and diagnostic challenge of this disease.

### Report of a Case

The patient, a 41-year-old man with a history of schizophrenia, presented for evaluation of anemia, weight loss and cough. He was well until 1983 when he sustained a massive upper gastrointestinal hemorrhage requiring a vagotomy and subtotal gastrectomy. He recovered without complications and did well until July 1985 when his hematocrit was noted to be low and unresponsive to iron, folate and vitamin B<sub>12</sub> therapy. Chest x-ray and barium enema films were normal. In addition, he had a six-month history of weight loss and a nonproductive cough for one week. He smoked heavily but said he did not have tuberculosis or chemical exposures and did not abuse drugs intravenously. Findings of a physical examination were significant for cachexia, extremely poor dentition, pulmonary bibasilar rales and right upper quadrant abdominal tenderness. A stool specimen was heme-negative. Laboratory studies elicited the following values: hemoglobin 8 grams per dl, hematocrit 24.6%, leukocyte count 12,600 per  $\mu$ l (65% polymorphonuclear neutrophils, 22% bands), platelets 754,000 per  $\mu$ l, erythrocyte sedimentation rate 143 mm per hour, prothrombin time 14.6 seconds (11.9, control), total protein 9.1 mg per dl, albumin 1.7 mg per dl, alkaline phosphatase 159 units per liter (Westergren), serum aspartate aminotransferase (glutamic-oxaloacetic transaminase) 28 units per liter and serum alanine aminotransferase (glutamic-pyruvic transaminase) 20 units per liter. A chest x-ray film showed many nodular lesions 0.5 to 2.5 cm in diameter predominantly in the lower lung fields (Figure 1). A blood smear showed 1+ macrocytes and microcytes with 2+ rouleaux.

Bronchoscopy and a transbronchial biopsy specimen showed nonspecific inflammation without granulomas. A smear was negative for acid-fast bacilli, and the patient was anergic to skin tests. The patient's condition continued to deteriorate, with daily fevers to 39.4°C (103°F), and his hematocrit dropped to 21%. A bone marrow aspirate and biopsy specimen, taken on day 3 of admission, showed a decreased erythroid series and a normal plasmacyte popula-

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